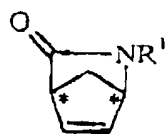


>98% was measured for the (-) enantiomer, which was proven by the prepared standard (Example 2.2). The unisolated analytical yield relative to the racemate was 46%.

Patent Claims

1. Method for preparing optically active compounds of the general formulas

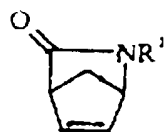


I



II

wherein R¹ is acyl or acyloxy and R² is a hydrogen atom or C₁₋₁₀ alkyl,
wherein a racemic lactam of the general formula



III

is converted by means of a hydrolase in the presence of a nucleophile and in the presence of a base in a constant pH range.

2. Method according to Claim 1, characterized in that a protease or lipase is used as the hydrolase.

3. Method according to Claim 2, characterized in that a serinprotease is used as the protease.

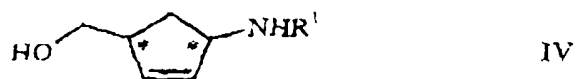
4. Method according to Claim 3, characterized in that a subtilisin is used as the serinprotease.

5. Method according to at least one of Claims 1 to 4, characterized in that 2-acetyl-2-azabicyclo[2.2.1]hept-5-ene-3-one or 2-ethoxycarbonyl-2-azabicyclo[2.2.1]hept-5-ene-3-one is used as the racemic lactam of general formula III.

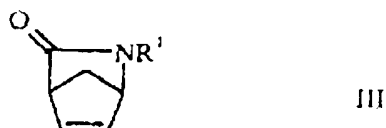
6. Method according to at least one of Claims 1 to 5, characterized in that the conversion is conducted in water, a buffer solution, a C₁₋₁₀ alcohol or in a mixture of these with an aprotic organic solvent.

7. Method according to at least one of Claims 1 to 6, characterized in that the reaction is conducted at a temperature of 10 to 60° C.

8. Method for the preparation of optically active 1-amino-4-(hydroxymethyl)-2-cyclopentene derivatives of the general formula



wherein R¹ is the same as in Claim 1, characterized in that a lactam of the general formula

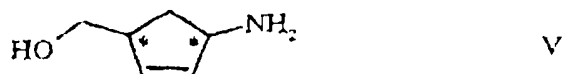


wherein R¹ is the same as in Claim 1, is converted by means of a hydrolase in the presence of a nucleophile and in the presence of a base in a constant pH range into the compound of the general formula

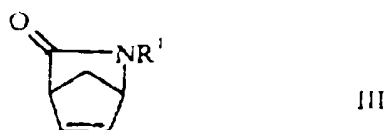


and this is reduced to the compound of general formula IV.

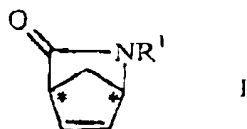
9. Method for the preparation of (1R,4S)-1-amino-4-(hydroxymethyl)-2-cyclopentene of the formula



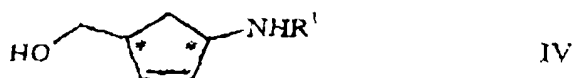
or its salts, characterized in that a lactam of the general formula



wherein R^1 is the same as in Claim 1, is converted by means of a hydrolase in the presence of a nucleophile and in the presence of a base in a constant pH range into the compound of the general formula



wherein R^1 is the same as in Claim 1, this is then reduced to the compound of the general formula



wherein R^1 is the same, and this is then hydrolyzed to the compound of formula V.

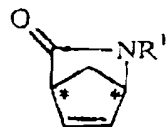
10. (1S,4R)-acetylamino-2-cyclopentene-1-carboxylic acid C_{2-10} alkyl esters, excluding (1S,4R)-acetylamino-2-cyclopentene-1-carboxylic acid ethyl ester.

11. (1S,4R)-acetylamino-2-cyclopentene-1-carboxylic acid ethyl ester or propyl ester.

4/11/01

Summary

A biotechnological method is described for preparing compounds of the general formulas

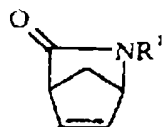


I



II

wherein R^1 is acyl or acyloxy and R^2 is a hydrogen atom or C_{1-10} alkyl, comprising the conversion of a lactam of the general formula



III

by means of a hydrolase in the presence of a nucleophile and in the presence of a base in a constant pH range.

Also described is the subsequent conversion of the compound of general formula I into the optically active 1-amino-4-(hydroxymethyl)-2-cyclopentene of the formula



V